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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/196,683    11/20/98    MIZUNO    S    2013/14

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EXAMINER

CREPEAU, J

ART UNIT

PAPER NUMBER

1745

DATE MAILED:

10/20/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/196,683

Applicant(s)

Mizuno

Examiner

Jonathan Crepeau

Group Art Unit

1745



☒ Responsive to communication(s) filed on Aug 24, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-19 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-19 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1-19. The claims remain rejected for the reasons of record. Therefore, this action is made final. The rejections are reiterated below.

### ***Claim Rejections - 35 USC § 103***

2. Claims 8-11, 13-15, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloomfield et al (U.S. Pat. 5,989,741) in view of Salfelder et al (U.S. Pat. 5,636,098).

In column 8, lines 14-40, Bloomfield et al disclose a polymer electrolyte membrane and gas diffusion electrode assembly which is bonded to support frames with a layer of polyurethane adhesive. The support frames define anode and cathode compartments, and thus function as separators.

Bloomfield et al do not explicitly teach that the adhesive may be a mixture of epoxy resin and modified silicone, or that the adhesive has a modulus of elasticity of not greater than 10 MPa or a durometer A hardness of not greater than 90 after cure.

In column 8, lines 50-57, Salfelder et al teach that conventional adhesives are used to adhere two insulating layers together. Salfelder et al disclose that suitable adhesives include

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“acrylics such as methacrylate, polyesters, polyamides, polyurethanes, epoxies, silicone containing adhesives, and mixtures thereof”.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because as exemplified by the teaching of Salfelder et al, polyurethanes, epoxies, and silicones are all conventional materials for adhering two objects together. Therefore, the skilled artisan would be able to use equivalent materials to adhere the membrane electrode assembly of Bloomfield et al to the separators. Substitution of equivalents does not require express motivation as long as the prior art recognizes the equivalency (see *In re Fount*, 312 USPQ 532 (CCPA 1982)). Furthermore, the courts have held that it is *prima facie* obvious to combine two compositions, each of which is taught by the prior art to be useful for the same purpose (in this case, epoxy and silicone) in order to form a third composition which is to be used for the very same purpose (*In re Kerkhoven*, 205 USPQ 1069 (CCPA 1980)). Salfelder even hints that a silicone and epoxy combination is known by using the phrase “and mixtures thereof” after the disclosure of the adhesive species.

Regarding the hardness and modulus of elasticity of the claimed adhesive after cure, these properties would be inherent upon combining the materials in the manner described above. Thus, these limitations are not considered to patentably distinguish over the references.

### *Response to Arguments*

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Applicant's arguments filed August 24, 2000 have been fully considered but they are not persuasive. Applicants state that Salfelder "does not teach that the properties of mixtures of these adhesives vary in a non-linear manner with different mixtures of the materials or otherwise suggest that dramatic changes in adhesive modulus of elasticity of durometer A hardness might be achieved by varying the proportions of epoxy and silicone adhesive". While the Examiner concurs with this statement, it is still not persuasive in overcoming the present rejection because it is not commensurate in scope with the claimed invention. The instant claims remain broad in scope, with some of the dependent claims reciting that the adhesive is a "mixture of epoxy resin and modified silicone". Since the instant claims do not recite the exact composition of the adhesive which allegedly produces the unexpected results of the invention, the disclosure of Salfelder is still considered to render the claims obvious. Accordingly, the hardness and modulus of elasticity are still seen as inherent in the adhesive mixture of Salfelder.

3. Claims 1-6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloomfield et al in view of Salfelder et al as applied to claims 8-11, 13-15, 18, and 19 above, and further in view of JP 9-199145.

The combination of Bloomfield et al and Salfelder et al do not explicitly teach that the polymer electrolyte has a molar water fraction of less than 4.

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In the abstract, the Japanese reference teaches a fuel cell in which the edge of the polymer electrolyte is made hydrophobic before being bonded to the separators.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the Japanese reference exemplifies that the practice of making the sealing portions of a polymer electrolyte membrane hydrophobic is well-known in the art. The artisan would thereby be motivated to make the sealing portions of Bloomfield's membrane hydrophobic in hopes of improving the sealability of the membrane with the separators. Additionally, the recitation of the molar fraction of water in the polymer electrolyte (i.e., a molar fraction of less than 4) is not considered to patentably distinguish over the references because the artisan would possess sufficient skill to optimize this water content during the process of making the edges of the membrane hydrophobic.

#### *Response to Arguments*

Applicant's arguments filed August 24, 2000 have been fully considered but they are not persuasive. Applicants state that the reference does not teach or suggest the present invention's water concentration reduction. In response, the Examiner cites paragraphs [0049] and [0050] of a computer-generated translation of JP 9-199145. This passage states, in part, that "an ion-exchange treatment dries electrolyte layer 21B..." (emphasis added). The reference generally teaches in these two paragraphs that an ion-exchanging (drying) treatment followed by a "revitalizing" (activating) treatment is carried out on the electrolyte membrane. Therefore, it is

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the Examiner's position that these teachings provide sufficient guidance and motivation for the artisan manipulate the water content of the membrane. Accordingly, the present grounds of rejection are maintained.

4. Claims 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloomfield et al in view of Salfelder et al as applied to claims 8-11, 13-15, 18, and 19 above, and further in view of Tamura et al (U.S. Pat. 5,328,816).

The combination of Bloomfield et al and Salfelder et al do not explicitly teach that resin beads of a predetermined diameter are included in the adhesive.

In column 4, lines 45-53 Tamura et al teaches that two substrates are laminated together with an adhesive containing spacer beads of a uniform particle diameter.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Tamura et al shows that using resin beads in an adhesive is a conventional method of keeping a uniform distance between two adhered substrates. The artisan would therefore be able to use this teaching as a way of keeping the thickness of the membrane/frame adhesion layer of Bloomfield et al at a predetermined value. Thus, this limitation is considered to be obvious to one of ordinary skill in the art.

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5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bloomfield et al in view of Salfelder et al in further view of JP 9-199145 as applied to claims 1-6 and 17 above, and further in view of Tamura et al.

The combination of Bloomfield et al, Salfelder et al, and JP 9-199145 do not explicitly teach that resin beads of a predetermined diameter are included in the adhesive.

In column 4, lines 45-53 Tamura et al teaches that two substrates are laminated together with an adhesive containing spacer beads of a uniform particle diameter.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Tamura et al shows that using resin beads in an adhesive is a conventional method of keeping a uniform distance between two adhered substrates. The artisan would therefore be able to use this teaching as a way of keeping the thickness of the membrane/frame adhesion layer of Bloomfield et al or the Japanese reference at a predetermined value. Thus, this limitation is considered to be obvious to one of ordinary skill in the art.

### *Conclusion*

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**



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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisors, Steve Kalafut or Carol Chaney, can be reached at (703) 308-0433 and (703) 305-3777, respectively. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900.

Documents may be faxed to (703) 306-3429. The official fax number for documents of extreme importance is (703) 305-3599 (it will take longer to receive documents faxed to this number; therefore the first number is preferred).

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Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

October 13, 2000

  
STEPHEN KALAFUT  
PRIMARY EXAMINER  
GROUP 1700